Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WAYNE ISAMI IMAINO, ANTHONY JULIANA,
MILTON RUSSELL LATTA, CHARLES H. LEE,
WAI CHEUNG LEUNG, HAL J. ROSEN,
STEVEN MEEKS, and RICHARD SONNENFELD

Appeal No. 2001-0864
Application No. 08/841,214

ON BRIEF

Before KRASS, JERRY SMITH, and DIXON, **Administrative Patent Judges**.

DIXON, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-8, 10-18 and 20. Claims 9 and 19 have been indicated by the examiner to be allowable if rewritten in independent form.

We REVERSE.

BACKGROUND

Appellants' invention relates to a surface inspection tool. An understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced below.

> 1. An apparatus for inspecting a planar surface of a disk for use in a disk drive comprising:
>
> means for scanning a laser beam (the incident beam) over at least a portion of a first planar surface of the disk to generate a reflected beam;
>
> a detector for converting an intensity of the reflected beam from the planar surface into an analog signal;
>
> means for sampling and digitizing the analog signal to generate pixel data stored in a buffer;
>
> means for calculating a rate of change in the intensity of the reflected beam from the pixel data; and
>
> means for applying a selected threshold to the rate of change in the intensity of the reflected beam to identify defects or features.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Cuthbert et al. (Cuthbert)	3,790,287	Feb. 5, 1974
Boehnlein et al. (Boehnlein)	5,307,152	Apr. 26, 1994
Bou-Ghannam et al. (Bou-Ghannam)	5,710,631	Jan. 20, 1998 (filed Jan. 27, 1997)
Womack et al. (Womack)	5,818,592	Oct. 6, 1998 (filed Feb. 7, 1997)

Claims 1-6, 8, 10-16, 18, and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Womack in view of Boehnlein further in view of Bou-Ghannam. Claims 6, 7, 16, and 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Womack, Boehnlein, and Bou-Ghannam further in view of Cuthbert.[1]

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejections, we make reference to the examiner's answer (Paper No. 15, mailed Aug. 23, 2000) for the examiner's reasoning in support of the rejections, and to appellants' brief (Paper No. 14, filed Jun. 13, 2000) for appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by appellants and the examiner. As a consequence of our review, we make the determinations which follow.

At the outset, we note that appellants indicate that there are related appeals in Serial No. 08/841,037 and Serial No. 08/840,351. We have reviewed the records of these applications and find that Serial No. 08/841,037 was allowed after filing of the appeal brief and is now US Patent No. 6,100,971. Serial No. 08/840,351 was appealed to the Board as Appeal No. 2000-1414 and was affirmed-in-part.

[1] We note that claims 6 and 16 are rejected under both grounds.

Appellants argue that claim 1 clearly establishes that appellants are using the intensity of the reflected beam and appellants are using a rate of change in intensity to detect stains on the surface of a disk which are only evidenced by changes in the reflectivity of the disk surface. (See brief at page 6.) We agree with appellants that Womack does not teach or fairly suggest the use of the rate of change of intensity. Appellants argue that Womack teaches away from the use of the rate of change of intensity. (See brief at page 6.) We disagree that Womack teaches away from the use of the rate of change of intensity to detect defects. Rather, we find that Womack teaches a different way of detecting defects.

Appellants argue that Boehnlein does not teach the use of the rate of change of intensity to detect defects and teaches away from the use of the rate of change of intensity to detect defects. As above, we agree with appellants that Boehnlein does not teach or fairly suggest the use of the rate of change of intensity. We disagree that Boehnlein teaches away from the use of the rate of change of intensity to detect defects. Rather, we find that Boehnlein teaches a different way of detecting defects. Appellants argue that the combination of Womack and Boehnlein would not teach of fairly suggest the use of the rate of change of intensity to detect defects. (See brief at page 7.) We agree with appellants.

Appellants argue that Bou-Ghannam is applied for its teaching of storing defect information and teaches the use of interferometry instead of intensity of the reflected

beam. Appellants argue that Bou-Ghannam does not teach or fairly suggest the use of the rate of change of intensity to detect defects and would not teach or fairly suggest the use of the rate of change of intensity to detect defects in combination with Womack and Boehnlein.

With respect to the intensity of the reflected beam, the examiner cites the teachings of Boehnlein concerning identifying defects by taking the derivative of a pixel intensity image and applying a threshold to identify defects. (See answer at pages 7-8.) The examiner maintains that the pixel value in Boehnlein corresponds to the intensity values and cites to column 6, lines 1-15. (See answer at page 8.) We disagree with the examiner. Appellants argue that Boehnlein teaches the use of interferometry to produce a phase map of the surface being inspected and the use of derivatives of the phase map and thresholds to the greatest change in contour. (See brief at page 7.) We agree with appellants and find that the pixel data is in the discussion of the prior art systems and that Boehnlein teaches the use of data from phase shifted moire image information rather than the intensity of the reflected light. (Boehnlein at columns 9 and 10.) These moire images are used to detect defects on the panel. Appellants argue that even if combined, none of the references teach (or fairly suggest) “a detector for converting an intensity of the reflected beam from the planar surface into an analog signal” and “means for calculating a rate of change in the intensity of the reflected beam from the pixel data.” (See brief at page 7.) We agree with appellants as discussed

above, and we will not sustain the rejection of independent claim 1 and its dependent claims 2-5, 8, and 10. Independent claim 11 contains similar limitations which are not taught or suggested by the combination of Womack, Boehnlein and Bou-Ghannam. Therefore, we will not sustain the rejection of independent claim 11 and its dependent claims 12-15, 18, and 20. With respect to dependent claims 6, 7, 16, and 17, the examiner does not rely upon the teaching of Cuthbert for the limitations that we found lacking in the combination above. Therefore, Cuthbert does not remedy the basic deficiency in the combination of Womack, Boehnlein and Bou-Ghannam as presented by the examiner, and we will not sustain the rejection of claims 6, 7, 16, and 17.

Additionally, we note that appellants argue the teachings of the three references are not properly combinable. (See brief at page 7.) We agree with appellants. From our review of the teachings of Womack with respect to wafer analysis, we find no teaching, suggestion or convincing line of reasoning by the examiner to look to the teachings of Boehnlein with respect to defects in panels of sheet material and then look to the teachings of Bou-Ghannam with respect to inspection of substrates for printed circuit boards. Therefore, we do not find the teachings of the three references to be properly combined to teach or suggest the invention as claimed. This is similarly extended to the teachings of Cuthbert.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-8 and 10-18 and 20 under 35 U.S.C. § 103 is reversed.

REVERSED

ERROL A. KRASS Administrative Patent Judge	)
JERRY SMITH Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
JOSEPH L. DIXON Administrative Patent Judge	)

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